GlobeCore

CATALOG

INSTRUMENTS AND EQUIPMENT FOR DIAGNOSTIC EVALUATION OF TRANSFORMER OIL

Poltava 2023

PREFACE:

Monitoring the transformer oil quality plays a vital role in overall evaluation of transformer status. In addition to its role as an insulation and a coolant, oil also serves as an information medium. This information may be related to the condition of another critical component — cellulose which influences the transformer operability and service life.

GlobeCore diagnostic evaluation equipment provides important and timely information needed to maintain the reliable and safe operation of the entire transformer fleet.

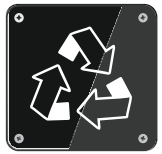
MAIN ADVANTAGES OF EQUIPMENT

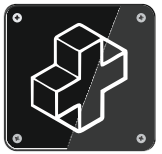
Low power consumption

Semi-automatic and automatic

Fast and accurate diagnostic evaluation

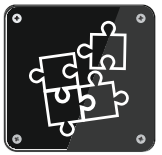
Exclusiveness


Continuous monitoring


Transformer care

Competitive price

Reliability


Ease of operation

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T OR - 1MS

TOR-1MS is an express tester designed to determine the moisture content and the temperature of transformer oil. In a best-case scenario, standard laboratory tests take a day, consume a great deal of human and financial resources in terms of time, and involve the high cost of services. The use of TOR-1MS allows testing and analyzing the transformer oil within the shortest possible time and making a quick decision in the field near the transformer.

Parameter	Value
The number of oil moisture measurement and indication systems	1
Operating range, aw (water activity (aw))	0...1
Operating range of dissolved water content measurement, ppm	0....100
Accuracy (water activity)	±3 %
Accuracy (moisture content)	±10 % or ±10 ppm
Temperature measurement	yes
Operating medium temperature, °C	0...55
Power requirement, W	10
Single phase 50 - 60 Hz AC power supply voltage, V	100-260
Dimensions, mm, not more than	
-length	190
-width	255
-height	365
Weight, kg, not more than	5.9

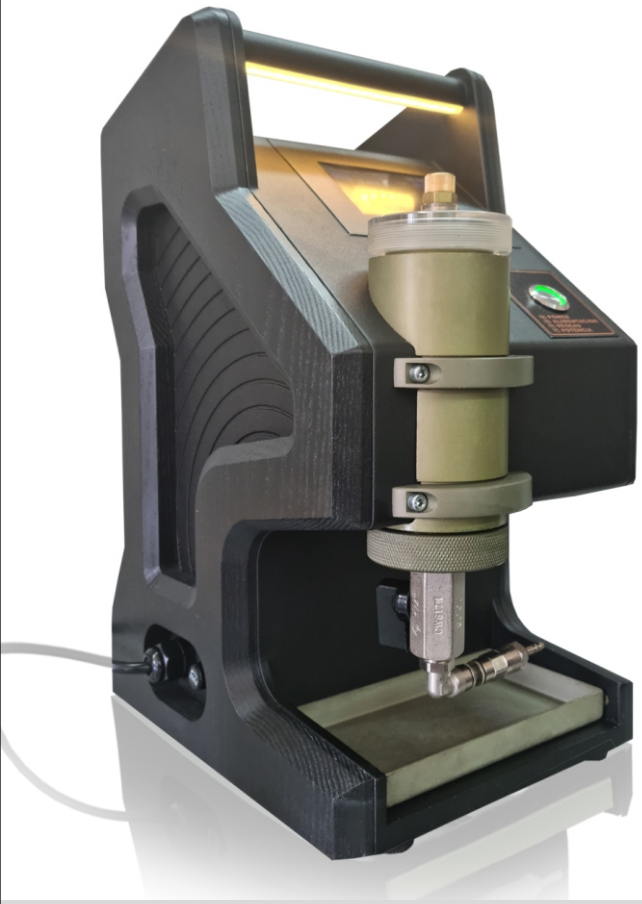
T OR - 1MD

TOR-1MD is an express tester for determining the moisture content and temperature of transformer oil. In a best-case scenario, standard laboratory tests take a day, consume a great deal of human and financial resources in terms of time, and involve the high cost of services. The use of TOR-1MD allows testing and analyzing the transformer oil within the shortest possible time and making a quick decision in the field near the transformer.

Parameter	Value
The number of oil moisture measurement and indication systems	2
Operating range, aw (water activity (aw))	0...1
Operating range of dissolved water content measurement, ppm:	
-for 1st system	0....100
-for 2nd system	0....1000
Accuracy (water activity)	±3 %
Accuracy (moisture content)	±10 % or ±10 ppm
Temperature measurement	yes
Operating medium temperature, °C	0...55
Power requirement, W	10
Single phase 50 - 60 Hz AC power supply voltage, V	100 - 260
Dimensions, mm, not more than	
-length	190
-width	255
-height	365
Weight, kg, not more than	5.9

TOR-2

TOR-2 transformer oil express tester is designed to determine the moisture content, the temperature, and the hydrogen content in insulating oils. TOR-2 is an express tester. In a best-case scenario, standard laboratory tests take a day, consume a great deal of human and financial resources in terms of time, and involve the high cost of services. The use of TOR-2 allows testing and analyzing the transformer oil within the shortest possible time and making a quick decision in the field near the transformer



Parameter	Value
Moisture measurement data	
Operating range, aw (water activity (aw))	0...1
Accuracy (water activity)	±3 %
Accuracy (moisture content)	±10 % or ±10 ppm
Temperature measurement	yes
Operating medium temperature, °C	0...55
Hydrogen measurement data	
Measurement range, ppm	25-5000
Precision	20% of indication, or 25 ppm
Repeatability	10% of indication, or 15 ppm
Response time	<60 min (90% of step change)
Cross-sensitivity:	Less than 2% of crosssensitivity to other gases (CO,CO_2, hydrocarbons)
Operating medium temperature, °C	0...55
Power requirement, W	60
Single phase 50 - 60 Hz AC power supply voltage, V	100 - 260
Dimensions, mm, not more than:	
-length	190
-width	255
-height	365
Weight, kg, not more than	5.5

TOR-3

TOR-3 instrument is designed to determine the dielectric loss tangent and the dielectric permittivity of transformer oil and other liquid dielectrics in accordance with IEC 60247 and the national standards, ASTM D924 corresponding thereto.

It constitutes a fully automatic device that ensures testing in accordance with the procedures defined in these standards, as well as in accordance with the user procedures specified in the appropriate section of the instrument menu.

Parameter	Value
Operating AC voltage, V	100-260
Power frequency, Hz	48 – 63
Power requirement, VA	Not more than 250
Applied measuring voltage AC, kV	Sinusoidal, 500 - 2000 V RMS
Measurement range, Tan δ	0.00001 – 4
Measurement resolution, Tan δ	$1x10^{-6}$
Measurement tolerance, Tan δ	+/- 1% of measurement + 0.00008
Measurement range of dielectric constant, ε	1.0 – 15.0
Measurement range of electrical capacitance, °C	20 – 1000 pF
Measurement range of oil temperature, °C	20 – 110
Measuring cell volume, cm^3	42
Electrical capacitance of empty cell	65 – 85 pF
One measurement duration, not more than, min	20
AC frequency setting range, Hz	45 – 65
Temperature measurement resolution, °C	0,5
Integrated printer	no
Operating temperature, °C	0 - 50
Storage temperature, °C	From – 20 to + 60
Relative humidity, %	Up to 90 without condensation
Dimensions, mm, not more than	400x450x300*
Weight, kg, not more than	5.3**

*With installed and connected cell

**With installed and connected cell

TOR-80A

The TOR-80A instrument is designed for assay transformer oil and other liquid dielectrics by measuring the electrical breakthrough voltage. The electrical breakthrough voltage is measured in accordance with IEC 60156, VDE 0370, ASTM D877, ASTM D1816, IRAM 2341. This list of standards can be modified and expanded according to the customers' wishes and to the development of standards' new versions.
The TOR-80A instrument feature is an internal rechargable battery that provides the possibility of autonomous operation in the field at the place of the transformer functioning.

Parameter	Value
Operating AC voltage, V	100 – 260
AC frequency of the power network, Hz	48 – 63
Electrical power, VA	100 max
Max. output voltage, kV	Sinusoidal, up to 80 kV RMS
Output voltage measurement accuracy, kV	± 1
Voltage increase rate, kV/sec (adjustable)	0.5 – 10.0
Measurement limit when displaying the output voltage, V	100
High voltage timeout after breakthrough, μs	10 max, 4 typical
Measuring cell roominess, cm^3	500
Temperature measurement range, °C	0 – 100
Temperature measurement resolution, °C	0.1
Built-in printer	yes
Rechargable battery pack	yes
Time of continuous autonomous operation (from battery), h	8
Battery charging time, h	8
Operating temperature, °C	-10 – 50
Transportation and storage temperature, °C	From -15 to +40
Relative humidity, %	Up to 90 without condensing
Atmospheric pressure, mmHg	630 – 800
Dimensions, mm, not more than	510x300x413
Weight, kg, not more than	38.1

TOR-80/TOR-100

TOR-80/TOR100 instrument is designed to determine the electric breakdown voltage of transformer oil and other liquid dielectrics in accordance with IEC 60156, ASTM D877, ASTM D1816.

It constitutes a fully automatic device that ensures testing in accordance with the procedures defined in these standards, as well as in accordance with the user procedures specified in the appropriate section of the instrument menu.

Parameter	Value
Operating AC voltage, V	100 - 260
Power frequency, Hz	48 – 63
Power requirement, VA	80 max
Maximum output voltage, kV	Sinusoidal, up to 80 kV (TOR-80) or 100 kV (TOR-100) RMS
Output voltage measurement tolerance, kV	±1
Voltage increase rate, kV/s	From 0.5 to 10 kV*
Resolution of output voltage indication, V	100
High voltage shutoff time after breakdown, μs	10 max, 4 typical
Measuring cell volume, cm^3	500
Measurement range of ambient temperature, °C	0 – 100
Temperature measurement resolution, °C	0.1
Integrated printer	yes
Operating temperature, °C	0 – 50
Storage temperature, °C	From – 20 to + 60
Relative humidity, %	Up to 90 without condensation
Dimensions, mm, not more than	510x300x334 (TOR-80) 510x300x350 (TOR-100)
Weight, kg, not more than	30

*Adjustable